INTRODUCTION

Michael Hart
NSLS Chairman

The hard work done by the synchrotron radiation community, in collaboration with all those using large-scale central facilities during 1995, paid off in FY 1996 through the DOE's Presidential Scientific Facilities Initiative. In comparison with the other DOE synchrotron radiation facilities, the National Synchrotron Light Source benefited least in operating budgets because we were unable to increase our running time beyond 100%- nevertheless, the number of station hours was maintained. The major thrust at Brookhaven came from a 15% increase in budget which allowed the recruitment of seven staff in the beamlines support group and permitted a step increment in the funding of the extremely long list of upgrades; both to the sources and to the beamlines.

During the December 1995 shutdown, the VUV Ring quadrant around U10-U12 was totally reconstructed. New front ends, enabling apertures up to 90 mrad on U10 and U12, were installed. During the year new PRTs were in formation for the infrared beamlines, encouraged by the investment we were able to commit from the initiative funds and by awards from the Scientific Facilities Initiative. A new PRT, specifically for small and wide angle

NSLS Management Group:

(front, from left)
Jerome Hastings, Long-Range/R&D;
Michael Hart, Chairman;
Sam Krinsky, Deputy Chairman;
Marty Woodle, Mechanical Engineering;
Bill Thomlinson, Associate Chairman;

(back, from left)
John Keane, Electrical Systems;
Peter Siddons, Beamline Support/R&D;
Frank Terrano, Assistant to the Chairman;
Richard Heese, Operations;
Ilan Ben-Zvi, Accelerator Test Facility.

x-ray scattering from polymers, will start work on X27C in FY 1997 and existing PRTs on X26C and X9B working on macromolecular crystallography will be joined by new members.

Plans to replace aging radio frequency cavities by an improved design, originally a painfully slow six or eight year project, were brought forward so that the first pair of cavities (half of the project for the X-Ray Ring) will now be installed in FY 1997. Current upgrades to 350 mA initially and to 438 mA later in the X-Ray Ring were set aside due to lack of funds for the necessary thermally robust beryllium windows. The Scientific Facilities Initiative allowed us to purchase all 34 windows in FY 1996 so that the power upgrade will be achieved in FY 1997. Half of the windows were installed during the December 1996 shutdown and the remainder will be installed during the May 1997 shutdown.

The NSLS Phase III upgrade, proposed in March 1994 and validated by DOE in 1995 showed how $22.5M could be used to maximize both the scientific output of the facility and the return on DOE's investment. Sixteen beamlines, four on the VUV Ring and twelve on the X-Ray Ring, could be made state of the art; improvements in beam position monitoring would lead to improved beam stability and reliability; replacement radio frequency cavities would insure reliability; and new narrow gap insertion devices could be developed. In addition 9,400 square feet of sorely needed laboratory and office space could be created on the second floor of the NSLS.

In the *one year* Scientific Facilities Initiative parts of this plan were realized. The results are dramatic; for a tiny investment, we will have *for the first time* a facility-owned general user Marr image plate and a CCD area detector available to optimize bending magnet and insertion device beamlines. Five x-ray beamlines will benefit from new focusing mirrors—impacting on the research of almost 200 users. As mentioned above, the first two new RF cavities will be available in FY 1997. The instrumentation pool will be almost doubled in value and program influence with the addition of a detector and two displex refrigerators.

In addition to the increased facility funding, the Scientific Facilities Initiative provided peer reviewed grants to users for specific beamline upgrades. Twelve user groups secured funds by this mechanism as follows:

Eric S. Jensen for *Ultra High Resolution Angle-Resolved Photoemission Spectrometer*

Malcolm Capel and Robert Sweet for *CCD Detector for Macromolecular Crystallography*

John W. Sutherland for *Monochromators for Elliptically Polarized Wiggler Beamline*

John D. Axe for *Magnets for Neutron and X-Ray Scattering*

L. Doon Gibbs for *Mirror Upgrades for Beamlines X22B,C*

Russell J. Hemley for *High Pressure Infrared Beamline*

Peter Pershan for *Upgrade of Harvard/Brookhaven Liquid Surface X-ray Spectrometer*

Dale Sayers for *Upgrade of Beamline X11A*

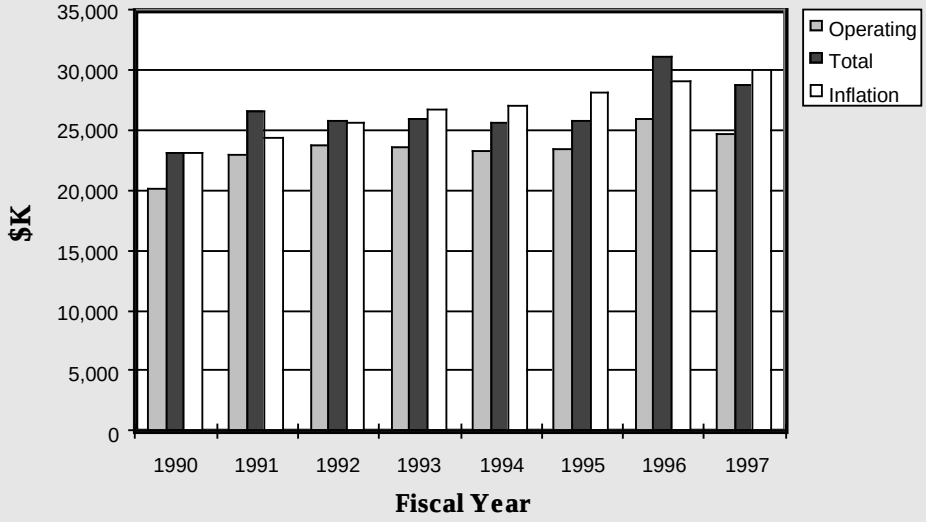
Theodore Madey for *Upgrade for Core-Level Photoemission Spectroscopy*

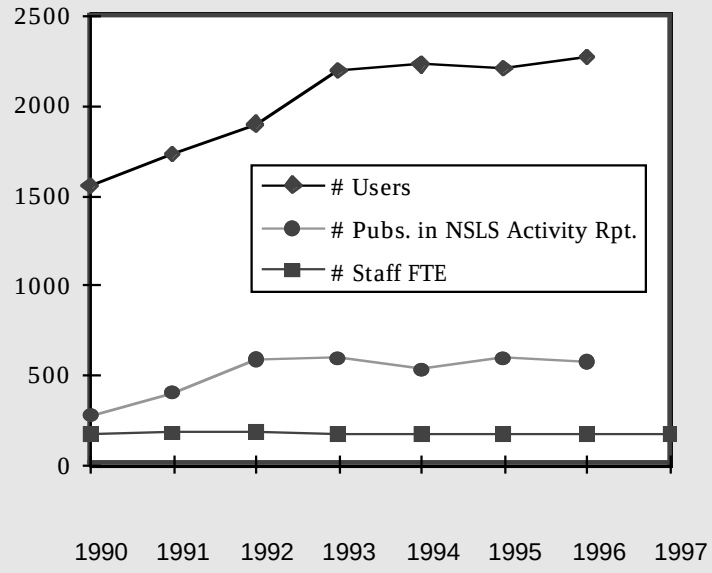
Janos Kirz for *Enhancement of the Scanning Transmission X-ray Microscope Facilities*

David Tanner for *Time-Resolved Far Infrared Spectrometer*

David Heskett for *Upgrade of Beamline X24A with Improved Electron Detector*

After such a glorious year it would be a shame to have to end on a down beat. Next year, however, the FY 1997 budgets once again seem to be below FY 1990 in real terms for NSLS (see figures).





(Above) NSLS Budgets over the past several years.
(Right) Chart showing number of users coming to the NSLS each year, number of publications listed in the Activity Report, and NSLS Staffing levels.

Apart from the individual years FY1991, FY1992 and FY1996 the NSLS budgets for Operations, Capital and Accelerator Repairs Improvements and Maintenance have not kept up with inflation. Level or slightly decreasing budgets lead essentially to constant levels of staffing. This has been so throughout the 1990s when user numbers and the scientific output of the facility have almost doubled.

Now, at the start of 1997, there is good news once again. The political climate is more encouraging for science and technology than it was in the recent past. The Energy Department in October 1996 announced a review, fundamental and far reaching in scope, of the provision by DOE of facilities for synchrotron radiation research in the U.S.A. As a third-generation facility serving research programs over by far the widest spectral range in the world (from 15mm to 3fm wave length), providing 75% of the station hours in the country in FY 1996 and having clear up-grade paths to the future, we anticipate making an exceptionally strong case for reinvestment.